Co./Dept

Phone

Jim Tierney 314 W. 6th Street North Platte, Nebraska 69101 (308) 532-2411

550581

September 5, 2001

Judy Treichel Nuclear Waste Task Force 4550 W. Oakey Blvd. Suite 111 Las Vegas, Nevada 89102

RE: On-site option for nuclear waste storage

To Whom It May Concern:

Please see attached information for on-site storage utilizing large granite rectangular blocks for encapsulation.

This information has previously been presented to the Department of Energy (D.O.E. #2000-0052). I believe this concept, which would not require transportation through Nevada, has not been properly considered by the D.O.E. As evidenced by lack of mention in the press.

Hope this is of some help.

Sincerely,

Jim Tierney

Kaitlin Backlund, Citizen Alert Cc: Mary Manning, Las Vegas Sun Tony Batt, Donrey Washington Bureau Keith Rogers, Las Vegas Review Journal The Nevada Agency for Nuclear Projects Department of Energy John Augustine

CONCEPTS

OF

GRANITE

(308) 650-2390

D.O.E # 2000-0052

August 27, 2001

To Whom it May Concern:

SUBJECT: Nuclear waste storage and encapsulation of spent nuclear fuel rods, mixed low-level nuclear waste, or transcranic waste.

My state-of-the-art concept will employ the use of 44 to 47-ton blocks of granite (approximately 600 million years old) from Rock of Ages Granite Quarry in Barre, Vermont. The blocks of granite that I will employ in my concept will each be 6' in width, 6' in height, and 15' in length. The quarry will cut, shape, and Core drill a center cut 4 'X4 'X 12' in the block as well as two 18" end caps. A ceramic epoxy sealer will be used to attach the endcaps once the nuclear waste is inside the granite block.

This concept will provide an alternative for spent nuclear fuel rods that are stored on-site at civilian nuclear power reactors in water storage basins. These same granite blocks can also be used as dry casks storage of 55-gailon barrels (each block holds 16 barrels), that can then be transported to a remote site, isolating the waste from the environment for the tens of thousands of years it takes for radioactivity decay. It is beyond deterioration of destruction, unlike methods currently in use or proposed.

In addition to being infinitely more safe and secure, my concept will save you (government or any of the other 38 governments) hundreds of millions of dollars over the current baseline option utilized in other storage methods. The cost of my state-of-the-art concept is 1.3% of what is currently being designed for use by the United States Department of Energy (\$334,000 to \$420,000) US-estimate. These costs do not include transportation, but are for storage only.

Rock of Ages Barre granite for the Vermont quarry is the world's finest, free from natural flaws, fissure, and joints, and is readily available (millions of tons). This granite is inexpensive to produce and offers great resistance to all environmental hazards, chemical, water and combustion materials.

Kenneth F. Werth

KENNETH F. WERTH

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Concests of Granito

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502 Rodec Road North Platte, Nebraska 59101

Phone 308-650-2390 Fax 308-532-9776

550581

August 29, 2001

To Whom It May Concern:

I am writing you to let you know of a concept that we have been working on with a Mr. Ken Werth. The concept consists of storage and encapsulation of spent nuclear rods, mixed low level nuclear waste and transcranic waste.

This concept is designed for on-site storage of spent fuel rods. These blocks of granite can be stacked up to six blocks high, which enables a lot of storage in a small amount of space.

I am enclosing his proposal along with density and testing results from Penn State,

His concept is not only unique, but will withstand the test of time.

The hardest material on earth, a diamond, has the hardness of a 10. It cannot be scratched except by other diamonds. The softest materials have a hardness of 1 and are easily scratched. Few materials, except precious stones, are harder than a 7.

Our Barre Granite is a very hard 6-7. No other natural stone used for commercial purposes is any harder or more difficult to break than granite.

I would be very interested in visiting with you in the future.

Please do not hesitate to call if you have any questions.

Thank you for your consideration on this matter.

Sincerely.

Lunnie C. Parsons

LP/PM

4

UNSOLICITED PROPOSAL FOR STORAGE OF NUCLEAR WASTES IN GRANITE BLOCKS

550581

May 7, 2001

Following are estimated costs for 50 test blocks to be used for transportation and storage of spent nuclear fuel rods and/or low-level and transcranic nuclear waste.

ESTIMATED COSTS

Granite blocks	50 @ \$50,400	\$2,520,000
*Transportation to site	50 @ \$12,900	\$ 645,000-(ESTIMATE)
**On-site handling		
Kenneth Werth	Fees for concept development/consultation, legal expenses, and staff	\$10,000,000
	***TOTAL	\$13,165,000

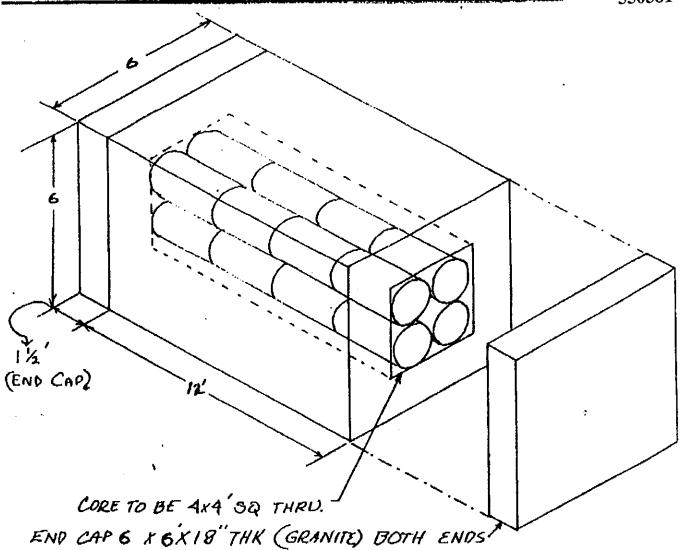
^{*}Transportation costs are related to distance and load. This estimate is based on transport from Rock of Ages quarry in Vermont.

KENNETH F. WERTH 6895 Flower Street Arvada, CO 80004 Tel: 303-424-0790

> Kenneth F. Werth Page 1 of 1

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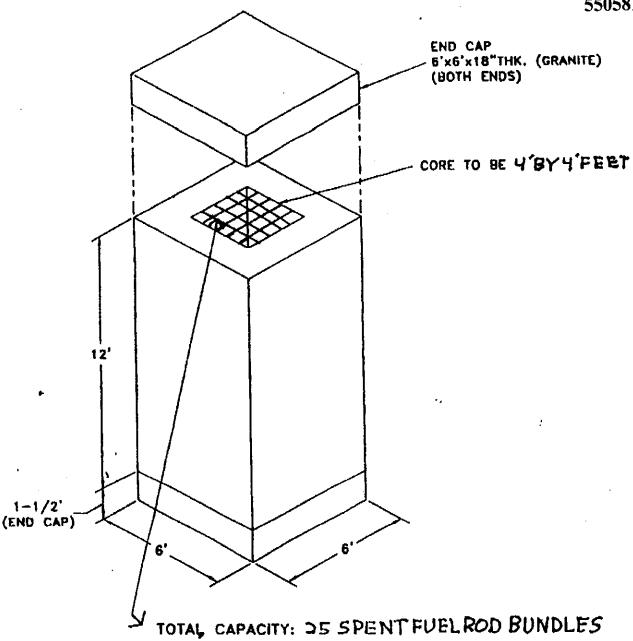
^{**}We have no way of estimating DOE or owner costs for on site handling, loading of waste, and monitoring this program.



TOTAL CAPACITY XXX CUBIC FEET,

NUCLEAR WASTE POLICY ACT OF 1982
TITLE II RESEARCH, DEVELOPMENT, AND DEMONSTRATION REGARDING
DISPOSAL OF HIGH LEVEL RADIOACTIVE WASTE AND SPENT NUCLEAR FUEL.

DESIGNED BY: KENNETH F. WERTH 6895 FLOWER ST. ARVADA, CO 80004 (303)424-0790	DRY CAST STOREAGE PROGRAM		
		ITE CONTAINING BLOCK FO HIGH LEVEL WASTE & ENT NUCLEAR FUEL RODS	
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NUCLEAR WASTE POLICY ACT OF 1982
TITLE II RESEARCH, DEVELOPMENT, AND DEMONSTRATION REGARDING
DISPOSAL OF HIGH LEVEL RADIOACTIVE WASTE AND SPENT NUCLEAR FUEL.

CEMBER BY: KENNETH F. WERTH	GRANITE CONTAINING BLOCK FOR HIGH LEVEL WASTE & SPENT NUCLEAR FUEL RODS		
5895 FLOWER ST. ARYADA, CO \$0004 (303)424-0790			
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ROCK MECHANICS LABORATORY

Department of Mineral Ingineering The Pennsylvania State University

Test Report RML 7/91

PHYSICAL PROPERTY TESTS ON BARRE GRANITE

Supplied by

Rock of Ages Corporation

Marra, Vermont

by

H. R. Hazdy, Jr.

B. J. Kimbie, Jr.

and

X. Bun

Eastember 8, 1991

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Alining Section Department of Mineral Engineering Cullege of Parth and Missers Sciences (R14) R63-1618 FAX (R14) 865-3248 116 Mineral Sciences Dundling The Penmylvania State University University Facts, PA 16802

Suptember 8, 1991

TO WHOM IT MAY CONCERN

Spacestion and Bulk Specific Gravity

SUBJECT: Test for Absorption and Bulk Specific Gravity on Specimens of Barre Granite supplied by Rock of Agas Corporation; Barre, Varmont. Three Specimens, approximately 2" x 2" x 2" were utilized. The bulk specific gravity was determined for each specimen according to ASTM designation C 97-90. The results were:

Specimen No. 1 - 2.65

Specimen No. 2 - 2.65

Specimen No. 3 - 2.65

Lowest Value Obtained - 2.65

Highest Value Obtained - 2.65

Average Value - 2.65.

The absorption was determined for each specimen according to ASTM designation C 97-90. The results were:

Specimen No. 1 - 0.3324

Specimen No. 2 - 0.2616

Specimen No. 3 - 0.255%

Lowest Value Obtained . 0.259%

Highest Value Obtained - 0.3324

Average Value - 0.284%

The tests were performed by Departmental Graduate Assistants in the Rock Hadianics Laboratory of the Department of Hineral Engineering.

Dr. A. Reginald Herdy, Jr. Professor and Hanager, Kock Hechanics Laboratory

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Mining Section Department of Mineral Engineering Children of Earth and Mineral Sciences

(8)4) 363-1615 FAX (814) 850 1705 III Mineral Sciences Buildit p The Peanty Ivania State University University Park, FA 16403

September 8, 1991

TO WHOM, IT HAY CONCERN

Somersualyo Strength - Perpendicular/bry

SUBJECT: Tests for Compressive Strength on Barre Granine supplied by Rock of Ages Corporation, Barre, Vermont. Core material, approximately 2.18" in diameter was provided by the above named company for these tests. This core material was prepared into suitable cylindrical test specimens having an average length of 4.679", and an average dimeter to length ratto (D/H) of 0,466. The compressive strength was determined perpendicular to rift plans under dry conditions for each specimen according to ASTH designation C 170-90 and was corrected for D/H ratio as described in C 170-90. The results were as follows:

Specimen No. 1 - 30,637 ps1

Specimen No. 2 - 30,106 pat

Specimen No. 3 - 31,764 pmi

SpecJmen No. 4 - 31,751 pai

Specimen No. 3 - 24,705 pel

Specimen No. 6 - 30,166 psi

Average - - - - 29,855 psi

The tests were performed by Department Graduate Assistants in the Rock Mechanics Laboratory of the Department of Mineral Engineering.

Professor and Manager,

Rock Hechanics Laboratory

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Aliming Section Experiment of Mineral Engineering College of Earth and Mineral Sciences (814) 863-1618 FAX (814) 865-3248

116 Afmeral Sciences Bullding The Pennsylvania State University University Park, 194 16802

September 8, 1991

TO WHOM IT MAY CONCERN

Compressive Strangth - Perpendicular, Wat

SUBJECT: Tests for Compressive Strength on Barre Granito supplied by Rock of Ages Corporation, Barre, Varmont, Core material, approximately 2.18" in diameter was provided by the above named company for these tests. This core material was propared into suitable cylindrical test specimens having an average length of 4.662", and an average diameter to length ratio (D/H) of 0.467. The compressive strength was determined perpendicular to rift plane under wet conditions for each

specimen according to ASTH designation C 170-90 and was corrected for D/H ratio as described in C 170-90. The results

were as follows:

Specimen No. 1 - 26,087 p=1

Specimen No. 2 - 25,428 psi

Specimen No. 3 - 22,688 psi

Specimen No. 4 - 26,180 pg1

Specimen No. 5 - 26,037 psi

Specimen No. 6 - 24,534 pm1

AYAYAMA - - - 25,159 psi

The tests were performed by Department Graduate Assistants in the Rock Mechanics Laboratory of the Department of Mineral Engineering.

Professor and Manager,

Rock Hechanics Laboratory

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Mining Section
Department of Mineral Engineering
College of Barth and Mineral Sciences

(834) R6.5 1618 PAX (834) 865-1248 816 Mineral Sum as Opilling The Pennsylvania Sate University University Park, 9-8 16802

September 8, 1991

TO WHOM IT HAY CONCERN

Compressive Strength - Parallel/Dry

SUBJECT: Tests for Compressive Strength on Barre Granite supplied by Rock of Ages Corporation, Barre, Vermont. Core material, approximately 2.0" in diameter was provided by the above named company for these tests. This core material was prepared into suitable cylindrical test specimens having an average length of 4.383, "and an average diameter to length ratio (D/H) of 0.464. The compressive strength was determined parallel to rift plane under dry conditions for each specimen according to ASTH designation C 170-90 and was corrected for D/H ratio as described in C 170-90. The results were as follows:

Specimen No. 1 - 30,873 psi

Specimen No. 2 - 31,964 ps1

Spacimen No. 3 - 28,865 p=1

Specimen No. 4 - 33,224 psi

Specimen No. 5 - 29,084 psi

Specimen No. 5 - 30,339 pm1

Average - - - - 30,725 psi

The tests were performed by Department Graduate Assistants in the Rock Machanics Laboratory of the Department of Mineral Engineering.

Dr. H. Auginald Herdy Jr. Professor and Hanager, Rock Hechanics laboratory

An Equal Opportunity University

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Mining Section
Department of Mineral Engineering
College of Earth and Mineral Sciences

1814) 863-1618 FAN (\$14) 865-3748

116 Mineral Sciences Building
The Fennish ania State University

University Park, PA 16892

September 8, 1991

TO WHOM IT MAY CONCERN

Compressive Strength - Parallel/Wat

SUBJECT: Tasts for Compressive Strength on Barrs Granite supplied by Rock of Ages Corporation, Barre, Vermont, Core material, approximately 2.0° in diameter was provided by the above named company for these tests. This core material was prepared into suitable cylindrical test specimens having an average length of 4,387°, and an average diameter to length ratio (D/H) of 0,465. The compressive strength was determined parallel to rift plane under wet conditions for each specimen according to ASTH designation C 170-90 and was corrected for D/H ratio as described in C 170-90. The results were as follows:

Specimen No. 1 - 24,525 psi

Specimen No. 2 - 25,148 psi

Specimen No. 3 - 20,769 pai

Spacimen No. 4 - 26,114 psi

Specimen No. 5 - 20,565 psi

Specimen No. G - 26,201 psi

Average - - - - 23.887 psi

The tests were performed by Department Graduate Assistants in the Rock Hechanics Laboratory of the Department of Mineral Engineering.

Dr. H. Reginald Hardy, Jr. Professor and Hanager,

Rock Hechanics Laboratory

An Equal Deponents, University

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Mining Section Department of Mineral Engineering. College of Earth and Affreral Sciences

(\$14) \$65 TOTS | FAX (\$14) \$65-3248 116 Mineral Sciences Bullding The Pennsylvania State University University Park, PA 16802

September 8, 1991

TO WHOM IT MAY CONCERN

Modulus of Runture - Perpendicular/Dry

SUBJECT: Test for Modulus of Rupture on Barrs Granite supplied by Rock of Ages Corporation, Barra, Vermont, Test material to prepare six specimens approximately #" (1) x 4"(W) x 2"(t) was shipped to the Department of Hineral Engineering by the above named company for these tests. The Modulus of Rupture was determined perpendicular to rift plane under dry ennditions for each specimen according to ASTM designation C99-8/. The results were as follows:

Spacimen No. 1 - 2,654 psi

Spacimen No. 2 - 2,477 pai

Specimen No. 3 - 2,372 psi

Specimen No. 4 - 2,706 psi

Specimen No. 5 - 2,675 pai

Specimen No. 6 - 2,531 pml

Average - - - 2,569 pai

The tests were performed by Department Graduate Assistants in the Rook Mechanics Laboratory of the Department of Mineral Engineering.

Professor and Hunager, Neck Machanics Inhoratory

An Equal Opportunity University

US-17-1999 TUE 02:59PM ID:

^{*} The specimen thickness used was approximately 2", rather than the specified 2-1/4". It is expected that this deviation would have little or no affect on the modulus of rupture values.

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Mining Section
Department of Mineral Engineering
College of Earth and Mineral Sciences

(\$14) 863-1618 FAX (\$14) \$65-3248

116 Mineral Sciences Building
The Prophylicania State University
University Park, PA 16802

September 8, 1991

TO WIGH IT MAY CONCERN

Modulus of Rupture . Perpendicular/Wet

SUBJECT: Test for Modulus of Rupture on Barre Granite supplied by Rock of Ages Corporation, Barre, Vermont. Test material to prepare six specimens suppressinately 8"(1) × h"(w) × 2"(t) was shipped to the Department of Mineral Engineering by the above named company for these tests. The Modulus or Rupture was determined perpendicular to rift plane under wet conditions for each specimen according to ASTH designation C99-87. The results were was follows:

Specimen No. 1 - 1,816 pai

Specimen No. 2 - 1,794 psi

Specimen No. 3 - 1,884 pai

Specimen No. 4 - 1,855 psi

Specimen No. 5 - 1,864 pai

Specimen No. 6 - 1,902 psi

Average - - · 1,853 pai

The tests were performed by Department Graduate Assistants in the Rock Hechanics laboratory of the Department of Hineral Engineering.

Dr. A. Raginald Hardy Jr. Professor and Hanager, Ronk Mechanics Laboratory

An Equal Opponunity University

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^{*} The specimen thickness used was approximately 2°, rather than the specified 2-1/4°. It is expected that this deviation would have little or no offect on the modulus of rupture values.

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116 Mineral Sciences Rullding The Pennsylvania State University University Park, PA 16802

Saptember 8, 1992

Department of Mineral Engineering College of Barth and Mineral Sciences

TO WHOM IT MAY CONCERN

Modulus of Rupture - Parallel/Dry

SUBJECT: Test for Modulus of Rupture on Barra Granite supplied by Ruck of Ages Corporation, Barre, Vermont, Test material to prepare six specimens approximately 5°(1) x 4°(u) x 2°(t) was shipped to the Department of Mineral Engineering by the above named company for these tests. The Modulus of Rupture was determined parallel to rift plane under dry conditions for each specimen according to ASTM designation C99-87. The results were was fellows:

Specimen No. 1 - 2,078 psi

Specimon No. 2 - 2,012 Dei

Specimen No. 3 - 2,169 pei

Specimen No. 4 . 2,132 psi

Specimen No. 5 - 2,021 psi

Specimen No. 6 - 2,102 psi

Average - - - - 2,097 psi

The tests were performed by Department Graduate Assistants in the Rock Hochenics laboratory of the Department of Hineral Engineering.

* The specimen thickness used was approximately 2", rather than the specified 2-1/4". It is expected that this deviation would have little or no effect on the modulum of tupture values.

> Professor and Manager. Rock Machanics Laboratory

An Equal Opportunity University

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Mining Section Department of Mineral Engineering College of Earth and Mineral Sciences (814) 853-1618 FAX (8)4) 863-3248 116 Mineral Sciences Outlding The eleminativered State educerate University Park, 1'4 16462

September 8, 1991

TO WHOM IT MAY CONCERN

Modulus of Bupture - Parallel /Wat

SUBJECT: Test for Hodulus of Rupture on Barre Granics supplied by Rock of Ages Corporation, Barre, Vermont. Test material to prepare six specimens approximately 8"(1) x 4"(w) x 2"(c) was shipped to the Department of Mineral Engineering by the above named company for these tests. The Modulus of Rupture was determined parallel to rift plane under wat conditions for each specimen according to ASTM designation 099-87. The results were was follows:

Specimen No. 1 - 1,841 pei

Specimen No. 2 - 1,841 psi

Specimen No. 3 - 1,726 psi

Specimen No. 4 - 1,718 psi

Specimen No. 5 - 1,797 pmi

Specimen No. 6 - 1,809 psi

Average - - - 1,785 psi

The tests were performed by Department Graduate Assistants in the Rock Mechanics Imboratory of the Department of Hineral Engineering.

* The specimen thickness used was approximately 2", rather than the specified 2-1/4". It is expected that this deviation would have little or no effect on the modulus of rupture values.

> Dr. B. Reginald Hardy. Professor and Menseyr,

Rock Mechanics Laboratory

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(\$1-1) 863-1618 FAX (814) 865-1249 118 Sifreral Sciencer Dullfing The Pennsylvania State University University Park, PA 16802

September 8, 1991

TO WHOM IT MAY CONCERN

Floxural Strangth - Perpandicular/Dry

SUBJECT: Tests for Flexural Strength on Barre Granite supplied by Rock of Ages Gerporation, Barre, Vermont. Suitable test material to prepare five specimens, approximately 12° (1) x $1-1/2^{\circ}$ (w) x 1° (t), was shipped to the Department of Minaral Engineering by the above named company for these tests. The Plexural Strength was determined Perpendicular to rift plane under dry conditions for each specimen according to ASTM designed C 880-89. A span length of 8" was used. The results were as follows:

Specimen No. 1 - 3028 psi

Specimen No. 2 - 2813 sei

Spanimen No. 3 - 3046 pai

Specimen No. 4 - 2880 psi

Specimen No. 5 - 2953 psl

Standard Davistion - -88 pul

The tests were performed by Dapartment Graduate Assistants in the Rock Mochanics Laboratory of the Department of Mineral Engineering.

> Dr. No Reginald Herd Professor and Director Rock Mechanics laboratory

An Equal Opportunity University

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Mining Section Department of Mineral Engineering College of Earth and Mineral Sciences

(B14) 863-1618 FAN (\$14) 865-3248 116 Mineral Sciences Bullding The Pennsylvania State University University Park, PA 16802

September 8, 1991

TO WHOM IT MAY CONCERN

Flaxural Straneth - Perpendicular/Vat

Tests for Finxural Strongth on Barrs Granite supplied by Rock of Ages Corporation, Barre, Vermont, Suitable test material to prepare five specimens, approximately 12" (1) x 1-1/2"(w) x 1"(t), was shipped to the Department of Mineral Engineering by the above named company for these tests. The Flexural Strongth was determined Perpendicular to rift plane under wet conditions for each specimen according to ASIM designed C 880-89. A span length of 8" was used. The results were as follows:

Specimen No. 1 - 2299 psi

Specimen No. 2 - 2394 pg1

Specimen No. 3 - 2397 pmi

Specimen No. 4 - 2304 psi

Specimen No. 5 - 2329 psi

Average - - - - 2345 psi

Standard Deviation - - 43 pai

The tests were performed by Department Graduate Assistants in the Rock Machanics laboratory of the Department of Mineral Engineering.

> Professor and Manager, Rock Mechanics laboratory

An Faux! Openments University

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Mining Section
Department of Affactal Engineering
Unilege of Earth and Mineral Sciences

(814) 861-2618 FAN (814) 805-3248 136 Minoral Sciences Bullding The Fenna, Ivania State University University Park, PA 16802

September 8, 1991

TO WHOM IT MAY CONCERN

Flexural Strength - Parallel/Dry

SUBJECT: Tests for Flexural Strength on Barra Granite supplied by Rock of Ages Corporation, Barre, Vermont, Suitable test material to prepare five specimens, approximately 12" (1) x 1-1/2"(w) x 1"(t), was shipped to the Department of Mineral Engineering by the above named company for these tests. The Flexural Strength was determined Parallel to rift plane under dry conditions for each specimen according to ASIM designed C 880-89. A span length of 8" was used. The results were as follows:

Specimen No. 1 - 1780 pst

Specimen No. 2 - 1961 per

Specimen No. 3 - 1836 psi

Specimen No. 4 - 2184 pai

Specimen No. 5 - 2141 pal

Average . - - - 1980 psi

Standard Deviation - - 160 pei

The tests were performed by Department Graduate Assistants in the Rock Mechanics laboratory of the Department of Hineral Engineering.

Dr. H Reginald Hardy Jr. Professor and Manager,

Rock Hechanics Laboratory

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UG-17-1999 TUE 03:03PM ID:

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follows:

Mining Section Department of Mineral Engineering College of Earth and Mineral Sciences

116 Mineral Sciences Building The Pennsylvania State University University Park, PA 16602

(#14) \$63-1618 FAX (\$14) \$65-3248

September 5, 1991

TO WHOM IT MAY CONCERN

Flaxural Strength - Parallel/Wet

SUBJECT: Tests for Flexural Strongth on Barre Granite supplied by Rock of Ages Corporation, Barre, Versont. Suitable test material to prepare five specimens, approximately 12° (1) \times 1-1/2°(w) \times 1°(t), was shipped to the Department of Mineral Engineering by the above named cospany for these tests. The Flexural Strength was determined Parallel to rist plane under wet conditions for each specimen according to ASTM designed C 880-89. A span length of 6" was used. The results were an

Specimen No. 1 - 1826 psi

Specimen No. 2 - 1676 pai

Specimen No. 3 - 1692 pai

Specimen No. 4 - 1793 psi

Specimen No. 5 - 1659 psi

Average - - - - 1729 ps1

Standard Deviation - - 57 psi

The nests were performed by Department Graduate Assistants in the Rock Mechanics Laboratory of the department of Mineral Engineering.

Professor and Hanager

Rock Mechanics laboratory

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